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# PATENT ABSTRACTS OF JAPAN

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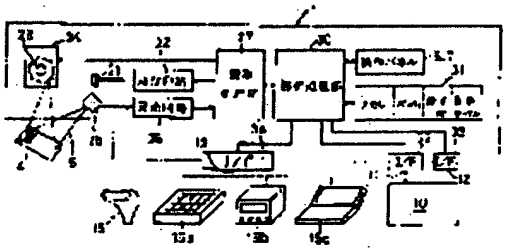
## (54) READ TEST INSTRUMENT FOR BAR CODE READER

(57)Abstract:

PURPOSE: To improve the precision of the read test by obtaining bar code data from one bar code of a moving measurement object plural times repeatedly and processing statistical data based on the result.

CONSTITUTION: When command to be in the movement test mode is given by operation of a switch group 7, a variable (i) is set to '0' and a timer is reset to perform the object read operation. If all bar code symbols can be decoded, the variable (i) is incremented, and the timer is reset. If it is judged that bar codes cannot be read or the processing is terminated, it is discriminated whether the timer exceeds 0.3 seconds or not. When the timer exceeds 0.3 seconds, time end of one read is discriminated, and the variable (i) indicating the frequency in read and the bar code which can be read are displayed on an LCD 6 and are outputted to a second interface 33. Then, the statistical processing is performed by an external apparatus.



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## CLAIMS

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[Claim(s)]
[Claim 1] Reading test equipment of the bar code reader equipped with the data capture actuation repeat means which repeats the actuation which obtains bar code data from one bar code of the measuring object which is reading test equipment of the bar code reader which obtains bar code data from the bar code of the measuring object, and moves two or more times, and a data-processing means to process the statistical data obtained based on said data capture actuation repeat means.
[Claim 2] A quiescence test-data acquisition means to be reading test equipment of the bar code reader which obtains bar code data from the bar code of the measuring object, and to obtain a quiescence test data from the bar code of the measuring object which stands it still, A migration test-data acquisition means to obtain a migration test data from the bar code of the measuring object which moves, Reading test equipment of the bar code reader equipped with the selection means as which either is alternatively operated among said quiescence test-data acquisition means and a migration test-data acquisition means, and a data-processing means to process the data obtained with the test-data acquisition means chosen with said selection means.
[Claim 3] Reading test equipment of the bar code reader equipped with a test-data acquisition means to obtain bar code data from the bar code of the measuring object and to be reading test equipment of a bar code reader, and to obtain a test data from the bar code of the measuring object, a data-processing means to process the data obtained with said test-data acquisition means, and an external output means to output the processing result in said data-processing means outside.

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## DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to reading test equipment and the reading test equipment of the bar code reader which obtains bar code data from the bar code of the measuring object especially.
[0002]
[Description of the Prior Art] A bar code is a sign which puts the image of the shape of a rod called a bar code symbol in order, and expresses alphabetic characters, such as a figure, and it is developed in order to use for a circulation information system. A bar code reader carries out the transverse scan of near the core of a bar code symbol by the laser beam, measures the width of face of a bar code symbol, and reads a code. This bar code reader is equipped with the scan section which usually has the laser light source and polygon mirror which discharge a laser beam, the receive section which receives the laser beam reflected from the bar code of the measuring object, and changes into an electrical signal, and the decoder which decodes the electrical signal acquired in the receive section.
[0003] In order to test the bar code reading stability in a bar code reader, the reading static test mode is prepared in the bar code reader. In a reading static test mode, it measures how many times the bar code was able to be read in 100 scan actuation by confronting a bar code reader with the bar code symbol concerned in the condition of having made the bar code of the measuring object standing it still. Since a measurement result is displayed on the display (LED and LCD) of a bar code reader, it can recognize the stability of reading actuation numerically.
[0004]
[Problem(s) to be Solved by the Invention] Although it has the composition of performing a reading test by reading the bar code symbol of the measuring object of a quiescent state, with said conventional configuration, the bar code symbol of the measuring object under migration is read in the field for which a bar code reader is actually used in many cases. Since disturbance factors, such as change of passing speed and vibration of the measuring object, are added when the measuring object is moving, with said conventional test configuration, actual reading stability cannot be known correctly.
[0005] Moreover, at said conventional bar code reader, a reading test result is displayed on the display of a bar code reader at percent. However, when testing continuously using much measuring objects, it cannot respond in the activity which looks at a display and is copied into a note etc. The purpose of this invention is to raise the precision of a reading test, as actual measurement actuation can perform a near reading test.
[0006] Another purpose of this invention is to enable it to correspond to a high-speed repeat reading test.
[0007]
[Means for Solving the Problem] The reading test equipment concerning the 1st invention is [ which obtains bar code data from the bar code of the measuring object ] for bar code readers. This reading test equipment is equipped with the data capture actuation repeat means which repeats the actuation which obtains bar code data from one bar code of the measuring object which moves two or more times, and a data-processing means to process the statistical data obtained based on the data capture actuation repeat means.
[0008] The reading test equipment concerning the 2nd invention is [ which obtains bar code data from the bar code of the measuring object ] for bar code readers. This reading test equipment has the selection means as which either operates alternatively among a quiescence test-data acquisition means obtain a quiescence test data from the bar code of the measuring object which stands it still, a migration test-data acquisition means obtain the bar code of the measuring object which moves to a migration test data, and a quiescence test-data acquisition means and a migration test-data acquisition means, and a data-processing means process the data obtained with the test-data acquisition means chosen with a selection means.

[0009] The reading test equipment concerning the 3rd invention is [ which obtains bar code data from the bar code of the measuring object ] for bar code readers. This reading test equipment is equipped with a test-data acquisition means to obtain a test data from the bar code of the measuring object, a data-processing means to process the data obtained with the test-data acquisition means, and an external output means to output the processing result in a data-processing means outside.

[0010]

[Function] In the reading test equipment concerning the 1st invention, a data capture actuation repeat means repeats the actuation which obtains bar code data from one bar code of the measuring object which moves two or more times. And a data-processing means processes the statistical data obtained based on the data capture actuation repeat means.

[0011] Here, since he is trying to obtain the statistical data about bar code data from one bar code of the measuring object which moves by repeating the actuation which obtains bar code data two or more times, even if it is the case where it is carried out to the measuring object which actual measurement actuation moves, actual measurement actuation can perform a near reading test. Consequently, the precision of a reading test improves.

[0012] In the reading test equipment concerning the 2nd invention, either a quiescence test-data acquisition means or the migration test-data acquisition means function alternatively, and the obtained data are processed. Therefore, according to each situation in the case of case and moving to which the measuring object is standing it still in actual measurement actuation, actual measurement actuation can perform a near reading test now here. Therefore, the precision of a reading test improves.

[0013] In the reading test equipment concerning the 3rd invention, after the test data obtained from the bar code of the measuring object is processed with a data-processing means, the processing result is outputted outside by the external output means. For this reason, in response to the output from an external output means, the further data processing, such as a statistical procedure of a test data, becomes possible with a suitable external instrument (for example, personal computer). Therefore, even if it performs actuation which obtains a test data repeatedly at high speed, it can respond to the repeat test of the high speed.

[0014]

[Example] In drawing 1 , the bar code reader 1 as which one example of this invention was adopted irradiates a laser beam 5 towards the bar code symbol 4 of the bar code label 3 stuck on the measuring object object 2. The measuring object object 2 may be laid in the installation base (not shown), and may be movable by a band conveyor (not shown) etc.

[0015] In the front face of a bar code reader 1, the switch group 7 containing LCD6 for a display, tea CHIKI7a for TICHI mode assignment, code input key 7b for an output code input, etc. is arranged. Moreover, the 1st for external connection - the 3rd connector 11-13 are formed in the side face of a bar code reader 1. The programmable controller 10 (an example for a signal output) is connected to the 1st connector 11 through the cable 9. Moreover, the handicap bar code reader 15 is connected to the 3rd connector 13 through the cable 14. An operator grasps the handicap bar code reader 15 by hand, and it can change the sense and location freely into the tolerance of a cable 14. In the handicap bar code reader 15, the same configuration as the reading means (after-mentioned) by the laser of a bar code reader 1 is equipped.

[0016] In addition, it replaces with a programmable controller 10 and drive driver circuits (neither is illustrated), such as an input terminal of a personal computer and a lamp group for reporting to an operator, may be connected if needed. The bar code reader 1 has the semiconductor laser diode 21 for irradiating a laser beam 5 to a bar code 4, as shown in drawing 2 . A semiconductor laser diode 21 is driven by the laser lighting circuit 22, and the laser beam 5 from a semiconductor laser diode 21 scans a bar code symbol 4 through the scan section 24 which has the polygon mirror 23. The laser beam 5 reflected by the bar code symbol 4 can be received by the photo detector 25 which consists of optoelectric transducers, such as a photodiode. The output signal of a photo detector 25 is inputted into the light-receiving circuit 26 which performs analog processing of signal shaping etc.

[0017] The laser lighting circuit 22 and the scan section 24 are driven by the reading processing section 27. Moreover, the detecting signal from the light-receiving circuit 26 is inputted into the reading processing section 27. In the reading processing section 27, while driving the laser lighting circuit 22 and the scan section 24 to predetermined timing, the input signal from the light-receiving circuit 26 is digitized. The digitized bar code signal is outputted to the analysis processing section 30.

[0018] The control panel which consists of LCD6 and a switch group 7, memory 31, and the interfaces 32-34 which have the 1st - the 3rd connector 11-13 are connected to the analysis processing section 30. Memory 31 includes comparative criteria, the becoming criteria table field of a criteria bar code or output code, the setting digit storage region, and the buffer area which memorizes input data temporarily.

[0019] In the analysis processing section 30, various processings (after-mentioned) of comparing the criteria bar code remembered to be the measured bar code are performed. As a processing result, signals, such as a comparison result of a measurement bar code and a criteria bar code, are outputted to programmable controller 10 grade through an interface 32. Moreover, measurement bar code information is outputted also to an interface 33. Therefore, when information machines and equipment (not shown), such as a personal computer, are connected to the 2nd connector 12, bar code information will be transmitted to the control device.

[0020] The bar code data from the handicap bar code reader 15 are inputted into an interface 34 through the 3rd connector 13. In addition, bar code data can also be outputted to the analysis processing section 30 from those devices by replacing with the handicap bar code reader 15, and connecting keyboard 15a, another bar code reader 15b, or personal computer 15c.

[0021] Next, actuation of an above-mentioned example is divided into measurement mode, TICHI mode, and a static test mode, and is explained with reference to the control flow chart ( drawing 3 - drawing 10 ) of the analysis processing section 30.

In the measurement modal analysis processing section 30, it judges whether timing signal TIM turns on in step S1 of drawing 3 . Moreover, at step S2, it judges whether the TICHI mode command TCH is made by tea CHIKI 7a of the switch group 7 being pushed by the operator. At step S3, it judges whether it was ordered in the input of output code by code input key 7b being operated.

[0022] Then, in step S4 of drawing 4 , it judges whether the digit setting command for setting up the significant-digit part of the read bar code by operating the switch group 7 was made. At step S5, it judges whether it was ordered in activation of the migration test which performs a reading test by operating the switch group 7, moving the measuring object. Moreover, at step S6, it judges whether the command of the quiescence test which performs a reading test in the condition of having made the measuring object standing it still was made. At step S7, other processings are performed, and if the processing is completed, it will return to step S1 of drawing 3 .

[0023] If timing signal TIM turns on, a program will shift to step S8 from step S1. At step S8, it judges whether the TICHI mode command TCH is made. In measurement mode, since the TICHI mode command is not made, measurement processing which shifts to step S9 and is shown in drawing 5 is performed. In measurement processing of drawing 5 , the bar code symbol 4 of the measuring object object 2 is read at step S21. Here, a semiconductor laser diode 21 emits light and the scan by the laser beam 5 to a bar code symbol 4 is performed because the polygon mirror 23 rotates. According to the reflected light from the bar code symbol 4 which carried out incidence to the photo detector 25, a photo detector 18 outputs an output signal to the light-receiving circuit 26. In the light-receiving circuit 26, shaping magnification of the input signal is carried out, and it outputs to the reading processing section 27. In the reading processing section 27, an input signal is digitized and it outputs to the analysis processing section 30.

[0024] At step S22, a bar code symbol 4 is decoded based on reading data. Here, a bar code symbol 4 is decoded about the digit part set up in the digit setting actuation (step S4 and step S18 of drawing 4 ) mentioned later. That is, since decode actuation is performed only about the digit part set up beforehand, decode processing is quickened and simplified here.

[0025] If decode processing at step S22 finishes, in step S23, it will judge whether reading of a bar code symbol 4 was possible. When reading is possible, it shifts to step S24. At step S24, reading data are once outputted to the buffer of memory 31. A start address is set to "1" in order to show that was possible for reading at this time. If processing at step S24 finishes, it will return to the main routine of drawing 3 and drawing 4 .

[0026] When it is judged in step S23 that decode was impossible, it shifts to step S25. At step S25, it judges whether timing signal TIM still turns on. While timing signal TIM turns on, reading actuation of return and a bar code symbol 4 is repeated to step S21. If timing signal TIM turns off while decode of a bar code symbol 4 has been disabling, it will shift to step S26 from step S25. At step S26, the error data in which it is shown that was impossible for decode are outputted to the buffer of memory 31. Here, since reading actuation is finished with decode impossible, "0" is written in a start address. If processing at step S26 finishes, it will return to the main routine of drawing 3 and drawing 4 .

[0027] On the other hand, it judges whether the data input from the outside was in the 3rd connector 13 at step S61 of drawing 9 . If there is an input from the outside, it will shift to step S62 from step S61. At step S62, it judges whether it is in TICHI mode. Here, since it is not in TICHI mode, it shifts to step S63. At step S63, the inputted data are outputted to the buffer of memory 31. Here, the head address which shows that reading of data was possible for is set to "1." That is, output processing to the buffer in step S63 is the same as output processing in step S24 of drawing 5 , and there is no difference essential to the storage condition within both buffer.

[0028] Furthermore, in drawing 10 which shows output processing, it judges whether data were written in the buffer of memory 31 at step S71. If data are written in a buffer, it will shift to step S72. At step S72, it judges whether reading

data were decipherable data. This decision is based on whether the head address of a buffer is "1." When it is decipherable reading data, it shifts to step S73. Step S73 compares the criteria bar code (preset value) memorized to the presetting field of memory 31, and the reading data in a buffer about the digit part (step S4 and step S18 of drawing 4 ) set up beforehand. Here, since comparison actuation is performed only about the digit part set up beforehand, there is little comparison throughput and it can shorten time amount required by the completion of processing.

[0029] Next, in step S75, O.K. output which means that it was able to be read is outputted through an interface 32. Moreover, O.K. display is performed also to LCD6. At step S76, it judges whether reading data were in agreement with the criteria bar code about the setting digit part. When in agreement, the comparison result (specifically numeric value of 1-31) which shows whether it was in agreement with which criteria bar code is outputted through an interface 32 at step S77 on the basis of the criteria table ( drawing 11 and drawing 12 ) mentioned later. Moreover, a comparison result is displayed also on LCD6.

[0030] On the other hand, when it is judged that reading data were in agreement with no criteria bar code in a criteria table in step S76, it shifts to step S78. At step S78, the output code Co (the example of drawing 12 "0") in case the presetting address Ap is "0" among the presetting tables of drawing 12 is outputted. In step S72, when the head address of the buffer of memory 31 is "0", it shifts to step S74. At step S74, NG output is outputted to an interface 32 and LCD6.

[0031] If processing at step S77, step S78, or step S74 finishes, it will shift to step S79. At step S79, the read bar code itself is outputted through an interface 32. Moreover, it displays also on LCD6 with output code Co.

If TICHI mode tea CHIKI 7a is pushed, it will go into TICHI mode. Here, if timing signal TIM turns on, it will shift to step S10 through step S8 from step S1 of drawing 3 , and preset treatment shown in drawing 6 will be performed.

[0032] In drawing 6 , processing at step S27 - step S29 is the same as that of step S21 - step S23 ( drawing 5 ). Moreover, processing at step S31 is the same as that of step S25 ( drawing 5 ). At step S30, reading data are memorized to the criteria table field of memory 31. Here, as shown in drawing 11 , a memory address is the value (1-31) of the presetting address Ap. Since the PURITTO address Ap is "1" at the beginning included in TICHI mode, reading data are memorized to the address "1." On the other hand, at step S32, since it is thought that the read error occurred, the data of the presetting address Ap concerned are cleared. If processing at step S30 or step S32 finishes, it will shift to step S11 of drawing 3 . The presetting address Ap is incremented at step S11. In addition, when the presetting address Ap is "31", it sets to "1."

[0033] In addition, if the depression of tea CHIKI 7a is canceled, it will shift to step S12 from step S2 of drawing 3 , and the presetting address Ap will be reset by "1." On the other hand, if the depression of tea CHIKI 7a is continued, 31 criteria bar codes (preset value) are memorizable in memory 31. When it is judged that there was a port input from the exterior through the 3rd connector 13 in step S61 of drawing 9 , at the time of TICHI mode, it shifts to step S64 from step S62. At step S64, input data is memorized to the presetting address Ap of the criteria table field of memory 31. In processing at this step S64, it is not distinguished about processing at step S32 ( drawing 6 ), and the storage to memory 31. That is, a criteria bar code is memorizable, treating identically to the measurement data based on bar code reader 1 the very thing the input data from the outside through the 3rd connector 13.

[0034] In changing the output code Co outputted in step S77 and step S78 ( drawing 10 ), the switch group 7 is operated and it considers as output code mode. Consequently, a program shifts to step S13 from step S3 of drawing 3 . At step S13, it judges whether the reset command was made. Moreover, at step S15, it judges whether it was ordered in termination in output code mode. Furthermore, at step S16, it judges whether the presetting address Ap of "1" - "31" was inputted.

[0035] If the presetting address Ap is inputted, it will shift to step S17 from step S16. At step S17, the output code Co related with the presetting address Ap concerned is received. The prime code Co which can be inputted here is the range of "0" - "31." If output code Co is received, the contents will be written in the criteria table of memory 31. The example of the criteria table in this case is shown in drawing 12 . In the example (A) of drawing 12 , output code when reading data are things other than a preset value is "0", when the presetting addresses Ap are "1", "2", and "3", output code is "1" and the presetting address Ap is divided into six kinds of groups like --. On the other hand, in the example (B) of drawing 12 , the output code Co when reading data are things other than a preset value is "0", and it is set up so that the output code Co when reading data are in agreement with one of preset values may be set to "5."

[0036] Since output code Co is outputted at step S77 or step S78 of drawing 10 based on the criteria table set up as shown in the example (A) or example (B) of drawing 12 , output code Co based on reading data can be changed free, and the degree of freedom of output code Co is high. Therefore, classification control of a group unit, and the coincidence / inequality output to the preset value of reading data can be performed now free, and simplification of the program in the external instrument (programmable controller 10 grade) connected to an interface 32 can be attained

now. Moreover, it also becomes possible by connecting a direct lamp etc., without connecting a programmable controller 10 to perform lighting control of a lamp.

[0037] On the other hand, if a reset command is made, it will shift to step S14 from step S13 of drawing 3 . At step S14, a setup of the criteria table shown in drawing 12 is returned to a default. Here, output code Co serves as the presetting address Ap and identitas ("0 [ namely, ] - "31""). Moreover, if a termination command is made, it will return from step S15 to a main routine.

[0038] If the setting command of the setting digit used in step S22 ( drawing 5 ), step S28 ( drawing 6 ), and step S73 ( drawing 10 ) is performed by operating the switch key group 7, a program will shift to step S18 from step S4 of drawing 4 . Please carry out "digit setting to LCD6 at step S18. ?" and a display are performed from what figure, and the input of a desired digit count is received, demanding a digit input from an operator. If an operator inputs a digit count, please input "digit count into LCD6 next. ?" and a display are performed to what figure and it waits for the input of a request digit count. If the input of the digit range used as the candidate for a comparison is received from an operator, after memorizing the set-up digit in memory 31, it returns to a main routine.

[0039] Since the digit set up here is used in step S22 grade, the futility of the processing which the garbage of bar code data takes can be excluded. For example, although a bar code consists of a country code, a manufacturer code, a bar code, and a check digit, I want to make only a bar code into a processing object in a JAN code in many cases. In that case, efficient bar code reading processing only using the bar code about a bar code can be performed by setting up the digit range of the bar code equivalent to a bar code at step S18.

If ordered in a migration static test mode by operating the static test mode switch group 7, it will shift to step S19 from step S5 of drawing 4 , and migration test processing of drawing 7 will be performed.

[0040] Variable i is set to "0" at step S41. Moreover, Timer T is reset at step S42. At step S43, object reading actuation is performed like step S21 ( drawing 5 ). Although decode processing is performed like step S22 at step S44, it judges whether it is decipherable about all the symbols of the bar code read here.

[0041] At step S45, it judges whether it was decipherable about all bar code symbols based on the processing in step S44. When decipherable, it shifts to step S49 and Variable i is incremented. Moreover, Timer T is reset in step S50. When it is judged that a bar code was not able to be read in step S45, or when processing at step S50 is completed, it shifts to step S46. At step S46, it judges whether Timer T became 0.3 seconds or more. 0.3 seconds is suitable time amount to judge the break of the bar code in the one measuring object, and the bar code in the following measuring object here, when 300 reading actuation is enabled in 1 second. Since it can judge that bar code data are read in one bar code while Timer T has not reached at 0.3 seconds, return and the bar code reading actuation not more than step S43 are repeated from step S46 to step S43.

[0042] Timer T exceeds 0.3 seconds, and if it is judged that reading of one bar code was completed, it will shift to step S47 from step S46. At step S47, while displaying the variable i which shows the count of legible to one bar code, and the bar code which was able to be read on LCD6, it is outputted to the 2nd interface 33. At step S48, it judges whether it was ordered by the operator in termination of a migration test. Return and the measurement actuation not more than step S41 are repeated to step S41 until the command of termination is made. If ordered in termination, it will return from step S48 to the main routine of drawing 3 and drawing 4 .

[0043] In an above-mentioned migration test, it is reading a bar code symbol 4, moving the measuring object object 2, and the count of reading in a migration condition can be counted. Therefore, actual measurement actuation can perform a near reading test now, and the precision of a reading test improves. In addition, the creation of count of the average or a histogram whose counted value (variable i) and bar code which were outputted through the 1st interface 32 statistics processing is performed with an external instrument, for example, are a count of reading is made.

[0044] Since the stability [ condition / of having moved the measuring object object 2 ] of reading can be recognized by this, decision of the need for corrections, such as reexamination of printing of the bar code label 3 and reexamination of a pasting location, conveyance backlash, and conveyance speed, is attained. Moreover, since counted value (variable i) and a bar code are not only displayed on LCD6, but are outputted outside through an interface 33, it can respond to a high-speed repeat reading test by connecting a suitable external instrument.

[0045] When a quiescence static test mode is specified by operating the switch group 7, it shifts to step S20 from step S6 of drawing 4 , and quiescence test processing of drawing 8 is performed. Variable i and Variable j are set to "0" at step S50. Processing at step S51 - step S53 is the same as processing at step S43 of drawing 7 - step S45.

[0046] At step S54, Variable i is incremented in order to count the count of a bar code which can be read, and it shifts to step S55. On the other hand, when decision at step S53 is No, it shifts to step S55, without performing processing at step S54. At step S55, Variable j is incremented in order to count the whole count of reading. And it judges whether Variable j was set to "100" in step S56. Return and the reading processing not more than step S51 are repeated to step

S51 until Variable j is set to "100." If Variable j is set to "100" in step S56, it will shift to step S57.
[0047] At step S57, while displaying the variable i which shows the count of reading, and the read bar code on LCD6, it outputs to the 2nd interface 33. Processing here is substantially the same as that of step S47 ( drawing 7 ). If processing at step S57 finishes, it will return to the main routine shown in drawing 3 and drawing 4 . Here, a test condition (a migration test and quiescence test) can be switched so that it may be in a near condition according to the actual Measuring condition of the measuring object object 2. Therefore, in this example, actual measurement actuation can perform a near reading test now, and the precision of a reading test improves.
[0048]
[Effect of the Invention] In the reading test equipment concerning the 1st invention, even if it is the case where the measuring object moves the actuation which obtains one bar code of the measuring object to the bar code data which move at the time of actual measurement of a bar code reader since statistical data are processed based on a multiple-times repeat and its result, the reading test near actual measurement actuation can be performed, and the precision of a reading test improves.
[0049] Since the switch of test actuation is possible between the cases where a migration test data is obtained from the bar code of the case where a quiescence test data is obtained from the bar code of the measuring object which stands it still in the reading test equipment concerning the 2nd invention, and the measuring object which moves, irrespective of quiescence/migration of the measuring object, the reading test near actual measurement actuation can be carried out now, and the precision of a reading test improves.
[0050] In the reading test equipment concerning the 3rd invention, since the processing result of a test data can be outputted outside, it can respond to a high-speed repeat reading test.

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## TECHNICAL FIELD

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[Industrial Application] This invention relates to reading test equipment and the reading test equipment of the bar code reader which obtains bar code data from the bar code of the measuring object especially.

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PRIOR ART

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[Description of the Prior Art] A bar code is a sign which puts the image of the shape of a rod called a bar code symbol in order, and expresses alphabetic characters, such as a figure, and it is developed in order to use for a circulation information system. A bar code reader carries out the transverse scan of near the core of a bar code symbol by the laser beam, measures the width of face of a bar code symbol, and reads a code. This bar code reader is equipped with the scan section which usually has the laser light source and polygon mirror which discharge a laser beam, the receive section which receives the laser beam reflected from the bar code of the measuring object, and changes into an electrical signal, and the decoder which decodes the electrical signal acquired in the receive section.
[0003] In order to test the bar code reading stability in a bar code reader, the reading static test mode is prepared in the bar code reader. In a reading static test mode, it measures how many times the bar code was able to be read in 100 scan actuation by confronting a bar code reader with the bar code symbol concerned in the condition of having made the bar code of the measuring object standing it still. Since a measurement result is displayed on the display (LED and LCD) of a bar code reader, it can recognize the stability of reading actuation numerically.

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## EFFECT OF THE INVENTION

[Effect of the Invention] In the reading test equipment concerning the 1st invention, even if it is the case where the measuring object moves the actuation which obtains one bar code of the measuring object to the bar code data which move at the time of actual measurement of a bar code reader since statistical data are processed based on a multiple-times repeat and its result, the reading test near actual measurement actuation can be performed, and the precision of a reading test improves.

[0049] Since the switch of test actuation is possible between the cases where a migration test data is obtained from the bar code of the case where a quiescence test data is obtained from the bar code of the measuring object which stands it still in the reading test equipment concerning the 2nd invention, and the measuring object which moves, irrespective of quiescence/migration of the measuring object, the reading test near actual measurement actuation can be carried out now, and the precision of a reading test improves.

[0050] In the reading test equipment concerning the 3rd invention, since the processing result of a test data can be outputted outside, it can respond to a high-speed repeat reading test.

[Translation done.]

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## TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] Although it has the composition of performing a reading test by reading the bar code symbol of the measuring object of a quiescent state, with said conventional configuration, the bar code symbol of the measuring object under migration is read in the field for which a bar code reader is actually used in many cases. Since disturbance factors, such as change of passing speed and vibration of the measuring object, are added when the measuring object is moving, with said conventional test configuration, actual reading stability cannot be known correctly.

[0005] Moreover, at said conventional bar code reader, a reading test result is displayed on the display of a bar code reader at percent. However, when testing continuously using much measuring objects, it cannot respond in the activity which looks at a display and is copied into a note etc. The purpose of this invention is to raise the precision of a reading test, as actual measurement actuation can perform a near reading test.

[0006] Another purpose of this invention is to enable it to correspond to a high-speed repeat reading test.

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MEANS

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[Means for Solving the Problem] The reading test equipment concerning the 1st invention is [ which obtains bar code data from the bar code of the measuring object ] for bar code readers. This reading test equipment is equipped with the data capture actuation repeat means which repeats the actuation which obtains bar code data from one bar code of the measuring object which moves two or more times, and a data-processing means to process the statistical data obtained based on the data capture actuation repeat means.
[0008] The reading test equipment concerning the 2nd invention is [ which obtains bar code data from the bar code of the measuring object ] for bar code readers. This reading test equipment has the selection means as which either operates alternatively among a quiescence test-data acquisition means obtain a quiescence test data from the bar code of the measuring object which stands it still, a migration test-data acquisition means obtain the bar code of the measuring object which moves to a migration test data, and a quiescence test-data acquisition means and a migration test-data acquisition means, and a data-processing means process the data obtained with the test-data acquisition means chosen with a selection means.
[0009] The reading test equipment concerning the 3rd invention is [ which obtains bar code data from the bar code of the measuring object ] for bar code readers. This reading test equipment is equipped with a test-data acquisition means to obtain a test data from the bar code of the measuring object, a data-processing means to process the data obtained with the test-data acquisition means, and an external output means to output the processing result in a data-processing means outside.

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OPERATION

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[Function] In the reading test equipment concerning the 1st invention, a data capture actuation repeat means repeats the actuation which obtains bar code data from one bar code of the measuring object which moves two or more times. And a data-processing means processes the statistical data obtained based on the data capture actuation repeat means.
[0011] Here, since he is trying to obtain the statistical data about bar code data from one bar code of the measuring object which moves by repeating the actuation which obtains bar code data two or more times, even if it is the case where it is carried out to the measuring object which actual measurement actuation moves, actual measurement actuation can perform a near reading test. Consequently, the precision of a reading test improves.
[0012] In the reading test equipment concerning the 2nd invention, either a quiescence test-data acquisition means or the migration test-data acquisition means function alternatively, and the obtained data are processed. Therefore, according to each situation in the case of case and moving to which the measuring object is standing it still in actual measurement actuation, actual measurement actuation can perform a near reading test now here. Therefore, the precision of a reading test improves.
[0013] In the reading test equipment concerning the 3rd invention, after the test data obtained from the bar code of the measuring object is processed with a data-processing means, the processing result is outputted outside by the external output means. For this reason, in response to the output from an external output means, the further data processing, such as a statistical procedure of a test data, becomes possible with a suitable external instrument (for example, personal computer). Therefore, even if it performs actuation which obtains a test data repeatedly at high speed, it can respond to the repeat test of the high speed.

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EXAMPLE

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[Example] In drawing 1 , the bar code reader 1 as which one example of this invention was adopted irradiates a laser beam 5 towards the bar code symbol 4 of the bar code label 3 stuck on the measuring object object 2. The measuring object object 2 may be laid in the installation base (not shown), and may be movable by a band conveyor (not shown) etc.
[0015] In the front face of a bar code reader 1, the switch group 7 containing LCD6 for a display, tea CHIKI7a for TICHI mode assignment, code input key 7b for an output code input, etc. is arranged. Moreover, the 1st for external connection - the 3rd connector 11-13 are formed in the side face of a bar code reader 1. The programmable controller 10 (an example for a signal output) is connected to the 1st connector 11 through the cable 9. Moreover, the handicap bar code reader 15 is connected to the 3rd connector 13 through the cable 14. An operator grasps the handicap bar code reader 15 by hand, and it can change the sense and location freely into the tolerance of a cable 14. In the handicap bar code reader 15, the same configuration as the reading means (after-mentioned) by the laser of a bar code reader 1 is equipped.
[0016] In addition, it replaces with a programmable controller 10 and drive driver circuits (neither is illustrated), such as an input terminal of a personal computer and a lamp group for reporting to an operator, may be connected if needed. The bar code reader 1 has the semiconductor laser diode 21 for irradiating a laser beam 5 to a bar code 4, as shown in drawing 2 . A semiconductor laser diode 21 is driven by the laser lighting circuit 22, and the laser beam 5 from a semiconductor laser diode 21 scans a bar code symbol 4 through the scan section 24 which has the polygon mirror 23. The laser beam 5 reflected by the bar code symbol 4 can be received by the photo detector 25 which consists of optoelectric transducers, such as a photodiode. The output signal of a photo detector 25 is inputted into the light-receiving circuit 26 which performs analog processing of signal shaping etc.
[0017] The laser lighting circuit 22 and the scan section 24 are driven by the reading processing section 27. Moreover, the detecting signal from the light-receiving circuit 26 is inputted into the reading processing section 27. In the reading processing section 27, while driving the laser lighting circuit 22 and the scan section 24 to predetermined timing, the input signal from the light-receiving circuit 26 is digitized. The digitized bar code signal is outputted to the analysis processing section 30.
[0018] The control panel which consists of LCD6 and a switch group 7, memory 31, and the interfaces 32-34 which have the 1st - the 3rd connector 11-13 are connected to the analysis processing section 30. Memory 31 includes comparative criteria, the becoming criteria table field of a criteria bar code or output code, the setting digit storage region, and the buffer area which memorizes input data temporarily.
[0019] In the analysis processing section 30, various processings (after-mentioned) of comparing the criteria bar code remembered to be the measured bar code are performed. As a processing result, signals, such as a comparison result of a measurement bar code and a criteria bar code, are outputted to programmable controller 10 grade through an interface 32. Moreover, measurement bar code information is outputted also to an interface 33. Therefore, when information machines and equipment (not shown), such as a personal computer, are connected to the 2nd connector 12, bar code information will be transmitted to the control device.
[0020] The bar code data from the handicap bar code reader 15 are inputted into an interface 34 through the 3rd connector 13. In addition, bar code data can also be outputted to the analysis processing section 30 from those devices by replacing with the handicap bar code reader 15, and connecting keyboard 15a, another bar code reader 15b, or personal computer 15c.
[0021] Next, actuation of an above-mentioned example is divided into measurement mode, TICHI mode, and a static test mode, and is explained with reference to the control flow chart ( drawing 3 - drawing 10 ) of the analysis processing section 30.

In the measurement modal analysis processing section 30, it judges whether timing signal TIM turns on in step S1 of drawing 3 . Moreover, at step S2, it judges whether the TICHI mode command TCH is made by tea CHIKI 7a of the switch group 7 being pushed by the operator. At step S3, it judges whether it was ordered in the input of output code by code input key 7b being operated.

[0022] Then, in step S4 of drawing 4 , it judges whether the digit setting command for setting up the significant-digit part of the read bar code by operating the switch group 7 was made. At step S5, it judges whether it was ordered in activation of the migration test which performs a reading test by operating the switch group 7, moving the measuring object. Moreover, at step S6, it judges whether the command of the quiescence test which performs a reading test in the condition of having made the measuring object standing it still was made. At step S7, other processings are performed, and if the processing is completed, it will return to step S1 of drawing 3 .

[0023] If timing signal TIM turns on, a program will shift to step S8 from step S1. At step S8, it judges whether the TICHI mode command TCH is made. In measurement mode, since the TICHI mode command is not made, measurement processing which shifts to step S9 and is shown in drawing 5 is performed. In measurement processing of drawing 5 , the bar code symbol 4 of the measuring object object 2 is read at step S21. Here, a semiconductor laser diode 21 emits light and the scan by the laser beam 5 to a bar code symbol 4 is performed because the polygon mirror 23 rotates. According to the reflected light from the bar code symbol 4 which carried out incidence to the photo detector 25, a photo detector 18 outputs an output signal to the light-receiving circuit 26. In the light-receiving circuit 26, shaping magnification of the input signal is carried out, and it outputs to the reading processing section 27. In the reading processing section 27, an input signal is digitized and it outputs to the analysis processing section 30.

[0024] At step S22, a bar code symbol 4 is decoded based on reading data. Here, a bar code symbol 4 is decoded about the digit part set up in the digit setting actuation (step S4 and step S18 of drawing 4 ) mentioned later. That is, since decode actuation is performed only about the digit part set up beforehand, decode processing is quickened and simplified here.

[0025] If decode processing at step S22 finishes, in step S23, it will judge whether reading of a bar code symbol 4 was possible. When reading is possible, it shifts to step S24. At step S24, reading data are once outputted to the buffer of memory 31. A start address is set to "1" in order to show that was possible for reading at this time. If processing at step S24 finishes, it will return to the main routine of drawing 3 and drawing 4 .

[0026] When it is judged in step S23 that decode was impossible, it shifts to step S25. At step S25, it judges whether timing signal TIM still turns on. While timing signal TIM turns on, reading actuation of return and a bar code symbol 4 is repeated to step S21. If timing signal TIM turns off while decode of a bar code symbol 4 has been disabling, it will shift to step S26 from step S25. At step S26, the error data in which it is shown that was impossible for decode are outputted to the buffer of memory 31. Here, since reading actuation is finished with decode impossible, "0" is written in a start address. If processing at step S26 finishes, it will return to the main routine of drawing 3 and drawing 4 .

[0027] On the other hand, it judges whether the data input from the outside was in the 3rd connector 13 at step S61 of drawing 9 . If there is an input from the outside, it will shift to step S62 from step S61. At step S62, it judges whether it is in TICHI mode. Here, since it is not in TICHI mode, it shifts to step S63. At step S63, the inputted data are outputted to the buffer of memory 31. Here, the head address which shows that reading of data was possible for is set to "1." That is, output processing to the buffer in step S63 is the same as output processing in step S24 of drawing 5 , and there is no difference essential to the storage condition within both buffer.

[0028] Furthermore, in drawing 10 which shows output processing, it judges whether data were written in the buffer of memory 31 at step S71. If data are written in a buffer, it will shift to step S72. At step S72, it judges whether reading data were decipherable data. This decision is based on whether the head address of a buffer is "1." When it is decipherable reading data, it shifts to step S73. Step S73 compares the criteria bar code (preset value) memorized to the presetting field of memory 31, and the reading data in a buffer about the digit part (step S4 and step S18 of drawing 4 ) set up beforehand. Here, since comparison actuation is performed only about the digit part set up beforehand, there is little comparison throughput and it can shorten time amount required by the completion of processing.

[0029] Next, in step S75, O.K. output which means that it was able to be read is outputted through an interface 32. Moreover, O.K. display is performed also to LCD6. At step S76, it judges whether reading data were in agreement with the criteria bar code about the setting digit part. When in agreement, the comparison result (specifically numeric value of 1-31) which shows whether it was in agreement with which criteria bar code is outputted through an interface 32 at step S77 on the basis of the criteria table ( drawing 11 and drawing 12 ) mentioned later. Moreover, a comparison result is displayed also on LCD6.

[0030] On the other hand, when it is judged that reading data were in agreement with no criteria bar code in a criteria table in step S76, it shifts to step S78. At step S78, the output code Co (the example of drawing 12 "0") in case the

presetting address Ap is "0" among the presetting tables of drawing 12 is outputted. In step S72, when the head address of the buffer of memory 31 is "0", it shifts to step S74. At step S74, NG output is outputted to an interface 32 and LCD6.

[0031] If processing at step S77, step S78, or step S74 finishes, it will shift to step S79. At step S79, the read bar code itself is outputted through an interface 32. Moreover, it displays also on LCD6 with output code Co.

If TICHI mode tea CHIKI 7a is pushed, it will go into TICHI mode. Here, if timing signal TIM turns on, it will shift to step S10 through step S8 from step S1 of drawing 3 , and preset treatment shown in drawing 6 will be performed.

[0032] In drawing 6 , processing at step S27 - step S29 is the same as that of step S21 - step S23 ( drawing 5 ). Moreover, processing at step S31 is the same as that of step S25 ( drawing 5 ). At step S30, reading data are memorized to the criteria table field of memory 31. Here, as shown in drawing 11 , a memory address is the value (1-31) of the presetting address Ap. Since the PURITTO address Ap is "1" at the beginning included in TICHI mode, reading data are memorized to the address "1." On the other hand, at step S32, since it is thought that the read error occurred, the data of the presetting address Ap concerned are cleared. If processing at step S30 or step S32 finishes, it will shift to step S11 of drawing 3 . The presetting address Ap is incremented at step S11. In addition, when the presetting address Ap is "31", it sets to "1."

[0033] In addition, if the depression of tea CHIKI 7a is canceled, it will shift to step S12 from step S2 of drawing 3 , and the presetting address Ap will be reset by "1." On the other hand, if the depression of tea CHIKI 7a is continued, 31 criteria bar codes (preset value) are memorizable in memory 31. When it is judged that there was a port input from the exterior through the 3rd connector 13 in step S61 of drawing 9 , at the time of TICHI mode, it shifts to step S64 from step S62. At step S64, input data is memorized to the presetting address Ap of the criteria table field of memory 31. In processing at this step S64, it is not distinguished about processing at step S32 ( drawing 6 ), and the storage to memory 31. That is, a criteria bar code is memorizable, treating identically to the measurement data based on bar code reader 1 the very thing the input data from the outside through the 3rd connector 13.

[0034] In changing the output code Co outputted in step S77 and step S78 ( drawing 10 ), the switch group 7 is operated and it considers as output code mode. Consequently, a program shifts to step S13 from step S3 of drawing 3 . At step S13, it judges whether the reset command was made. Moreover, at step S15, it judges whether it was ordered in termination in output code mode. Furthermore, at step S16, it judges whether the presetting address Ap of "1" - "31" was inputted.

[0035] If the presetting address Ap is inputted, it will shift to step S17 from step S16. At step S17, the output code Co related with the presetting address Ap concerned is received. The prime code Co which can be inputted here is the range of "0" - "31." If output code Co is received, the contents will be written in the criteria table of memory 31. The example of the criteria table in this case is shown in drawing 12 . In the example (A) of drawing 12 , output code when reading data are things other than a preset value is "0", when the presetting addresses Ap are "1", "2", and "3", output code is "1" and the presetting address Ap is divided into six kinds of groups like --. On the other hand, in the example (B) of drawing 12 , the output code Co when reading data are things other than a preset value is "0", and it is set up so that the output code Co when reading data are in agreement with one of preset values may be set to "5."

[0036] Since output code Co is outputted at step S77 or step S78 of drawing 10 based on the criteria table set up as shown in the example (A) or example (B) of drawing 12 , output code Co based on reading data can be changed free, and the degree of freedom of output code Co is high. Therefore, classification control of a group unit, and the coincidence / inequality output to the preset value of reading data can be performed now free, and simplification of the program in the external instrument (programmable controller 10 grade) connected to an interface 32 can be attained now. Moreover, it also becomes possible by connecting a direct lamp etc., without connecting a programmable controller 10 to perform lighting control of a lamp.

[0037] On the other hand, if a reset command is made, it will shift to step S14 from step S13 of drawing 3 . At step S14, a setup of the criteria table shown in drawing 12 is returned to a default. Here, output code Co serves as the presetting address Ap and identitas ("0 [ namely, ] - "31""). Moreover, if a termination command is made, it will return from step S15 to a main routine.

[0038] If the setting command of the setting digit used in step S22 ( drawing 5 ), step S28 ( drawing 6 ), and step S73 ( drawing 10 ) is performed by operating the switch key group 7, a program will shift to step S18 from step S4 of drawing 4 . Please carry out "digit setting to LCD6 at step S18. ?" and a display are performed from what figure, and the input of a desired digit count is received, demanding a digit input from an operator. If an operator inputs a digit count, please input "digit count into LCD6 next. ?" and a display are performed to what figure and it waits for the input of a request digit count. If the input of the digit range used as the candidate for a comparison is received from an operator, after memorizing the set-up digit in memory 31, it returns to a main routine.

[0039] Since the digit set up here is used in step S22 grade, the futility of the processing which the garbage of bar code data takes can be excluded. For example, although a bar code consists of a country code, a manufacturer code, a bar code, and a check digit, I want to make only a bar code into a processing object in a JAN code in many cases. In that case, efficient bar code reading processing only using the bar code about a bar code can be performed by setting up the digit range of the bar code equivalent to a bar code at step S18.
If ordered in a migration static test mode by operating the static test mode switch group 7, it will shift to step S19 from step S5 of drawing 4 , and migration test processing of drawing 7 will be performed.
[0040] Variable i is set to "0" at step S41. Moreover, Timer T is reset at step S42. At step S43, object reading actuation is performed like step S21 ( drawing 5 ). Although decode processing is performed like step S22 at step S44, it judges whether it is decipherable about all the symbols of the bar code read here.
[0041] At step S45, it judges whether it was decipherable about all bar code symbols based on the processing in step S44. When decipherable, it shifts to step S49 and Variable i is incremented. Moreover, Timer T is reset in step S50. When it is judged that a bar code was not able to be read in step S45, or when processing at step S50 is completed, it shifts to step S46. At step S46, it judges whether Timer T became 0.3 seconds or more. 0.3 seconds is suitable time amount to judge the break of the bar code in the one measuring object, and the bar code in the following measuring object here, when 300 reading actuation is enabled in 1 second. Since it can judge that bar code data are read in one bar code while Timer T has not reached at 0.3 seconds, return and the bar code reading actuation not more than step S43 are repeated from step S46 to step S43.
[0042] Timer T exceeds 0.3 seconds, and if it is judged that reading of one bar code was completed, it will shift to step S47 from step S46. At step S47, while displaying the variable i which shows the count of legible to one bar code, and the bar code which was able to be read on LCD6, it is outputted to the 2nd interface 33. At step S48, it judges whether it was ordered by the operator in termination of a migration test. Return and the measurement actuation not more than step S41 are repeated to step S41 until the command of termination is made. If ordered in termination, it will return from step S48 to the main routine of drawing 3 and drawing 4 .
[0043] In an above-mentioned migration test, it is reading a bar code symbol 4, moving the measuring object object 2, and the count of reading in a migration condition can be counted. Therefore, actual measurement actuation can perform a near reading test now, and the precision of a reading test improves. In addition, the creation of count of the average or a histogram whose counted value (variable i) and bar code which were outputted through the 1st interface 32 statistics processing is performed with an external instrument, for example, are a count of reading is made.
[0044] Since the stability [ condition / of having moved the measuring object object 2 ] of reading can be recognized by this, decision of the need for corrections, such as reexamination of printing of the bar code label 3 and reexamination of a pasting location, conveyance backlash, and conveyance speed, is attained. Moreover, since counted value (variable i) and a bar code are not only displayed on LCD6, but are outputted outside through an interface 33, it can respond to a high-speed repeat reading test by connecting a suitable external instrument.
[0045] When a quiescence static test mode is specified by operating the switch group 7, it shifts to step S20 from step S6 of drawing 4 , and quiescence test processing of drawing 8 is performed. Variable i and Variable j are set to "0" at step S50. Processing at step S51 - step S53 is the same as processing at step S43 of drawing 7 - step S45.
[0046] At step S54, Variable i is incremented in order to count the count of a bar code which can be read, and it shifts to step S55. On the other hand, when decision at step S53 is No, it shifts to step S55, without performing processing at step S54. At step S55, Variable j is incremented in order to count the whole count of reading. And it judges whether Variable j was set to "100" in step S56. Return and the reading processing not more than step S51 are repeated to step S51 until Variable j is set to "100." If Variable j is set to "100" in step S56, it will shift to step S57.
[0047] At step S57, while displaying the variable i which shows the count of reading, and the read bar code on LCD6, it outputs to the 2nd interface 33. Processing here is substantially the same as that of step S47 ( drawing 7 ). If processing at step S57 finishes, it will return to the main routine shown in drawing 3 and drawing 4 . Here, a test condition (a migration test and quiescence test) can be switched so that it may be in a near condition according to the actual Measuring condition of the measuring object object 2. Therefore, in this example, actual measurement actuation can perform a near reading test now, and the precision of a reading test improves.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]
[Drawing 1] The strabism schematic diagram showing one busy condition of the bar code reader as which one example of this invention was adopted.
[Drawing 2] The outline block diagram showing the internal configuration of said bar code reader.
[Drawing 3] The flow chart which shows the control function of the analysis processing section.
[Drawing 4] The flow chart which shows the control function of the analysis processing section.
[Drawing 5] The flow chart which shows the control function of the analysis processing section.
[Drawing 6] The flow chart which shows the control function of the analysis processing section.
[Drawing 7] The flow chart which shows the control function of the analysis processing section.
[Drawing 8] The flow chart which shows the control function of the analysis processing section.
[Drawing 9] The flow chart which shows the control function of the analysis processing section.
[Drawing 10] The flow chart which shows the control function of the analysis processing section.
[Drawing 11] The conceptual diagram of the criteria table showing the relation between the presetting address and a criteria bar code.
[Drawing 12] The conceptual diagram of the criteria table showing the relation between the presetting address and output code.
[Description of Notations]
1 Bar Code Reader
2 Measuring Object Object
4 Bar Code Symbol
11 Connector
25 Photo Detector
27 Reading Processing Section
30 Analysis Processing Section
31 Memory
32 Interface

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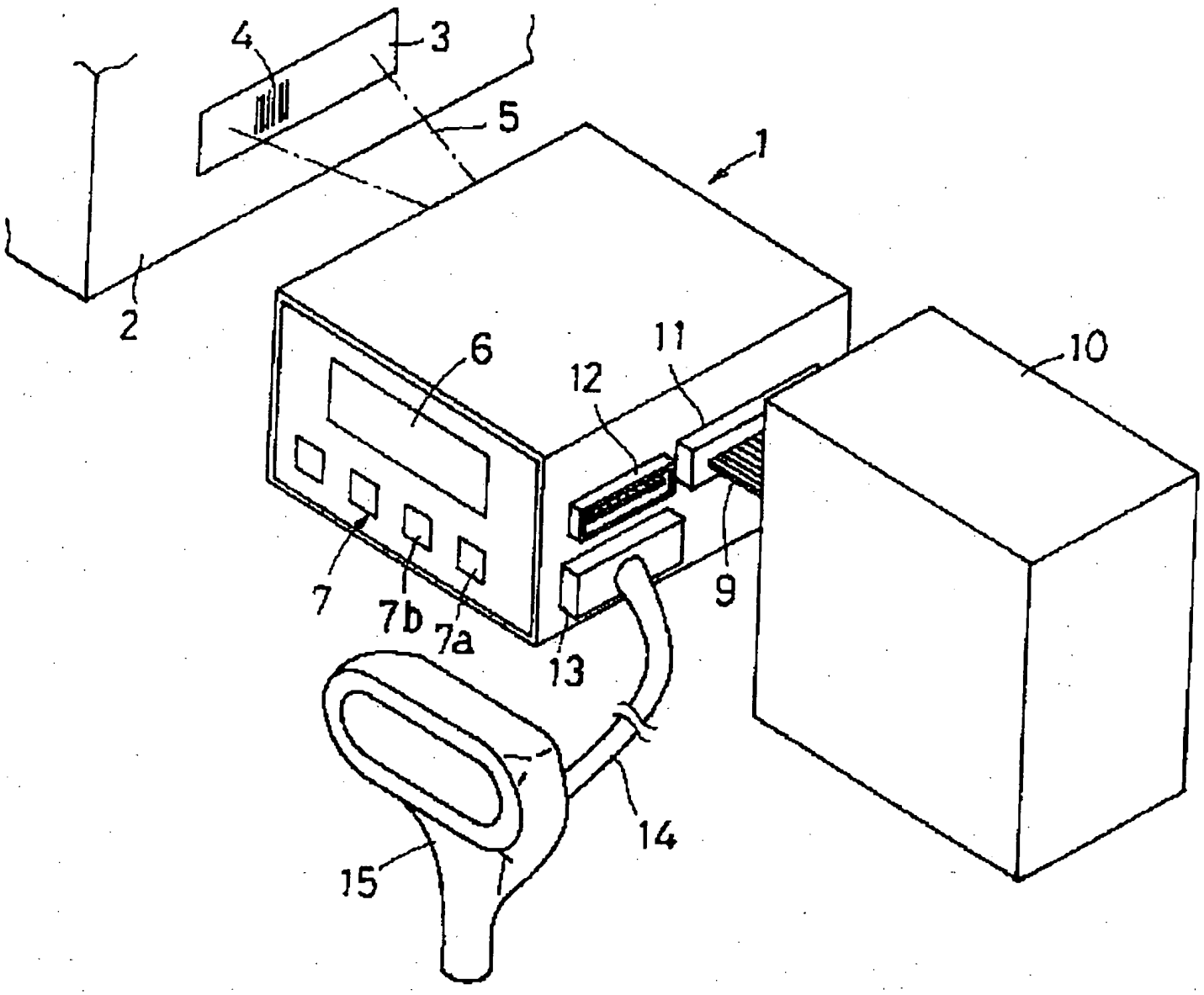
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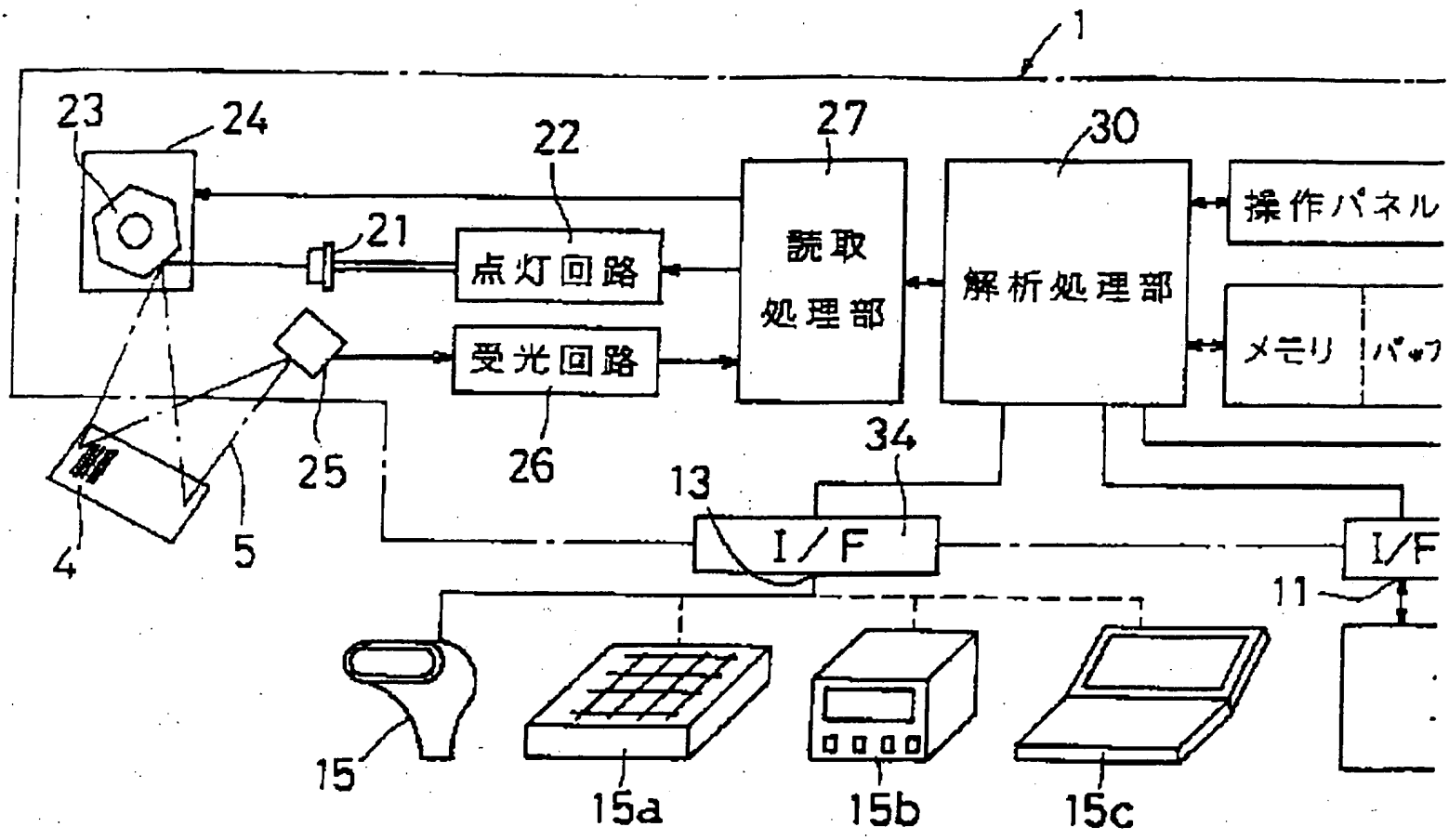
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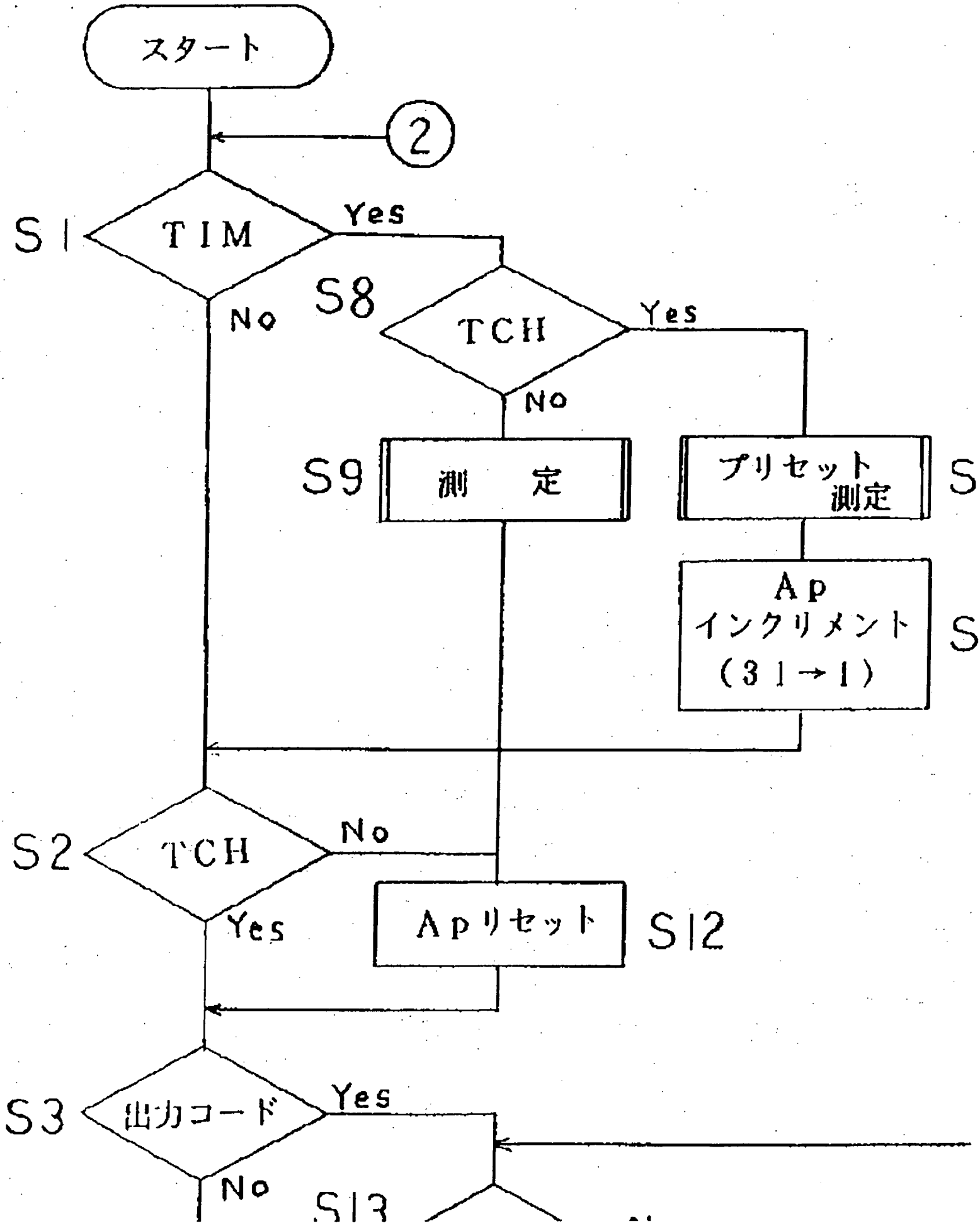
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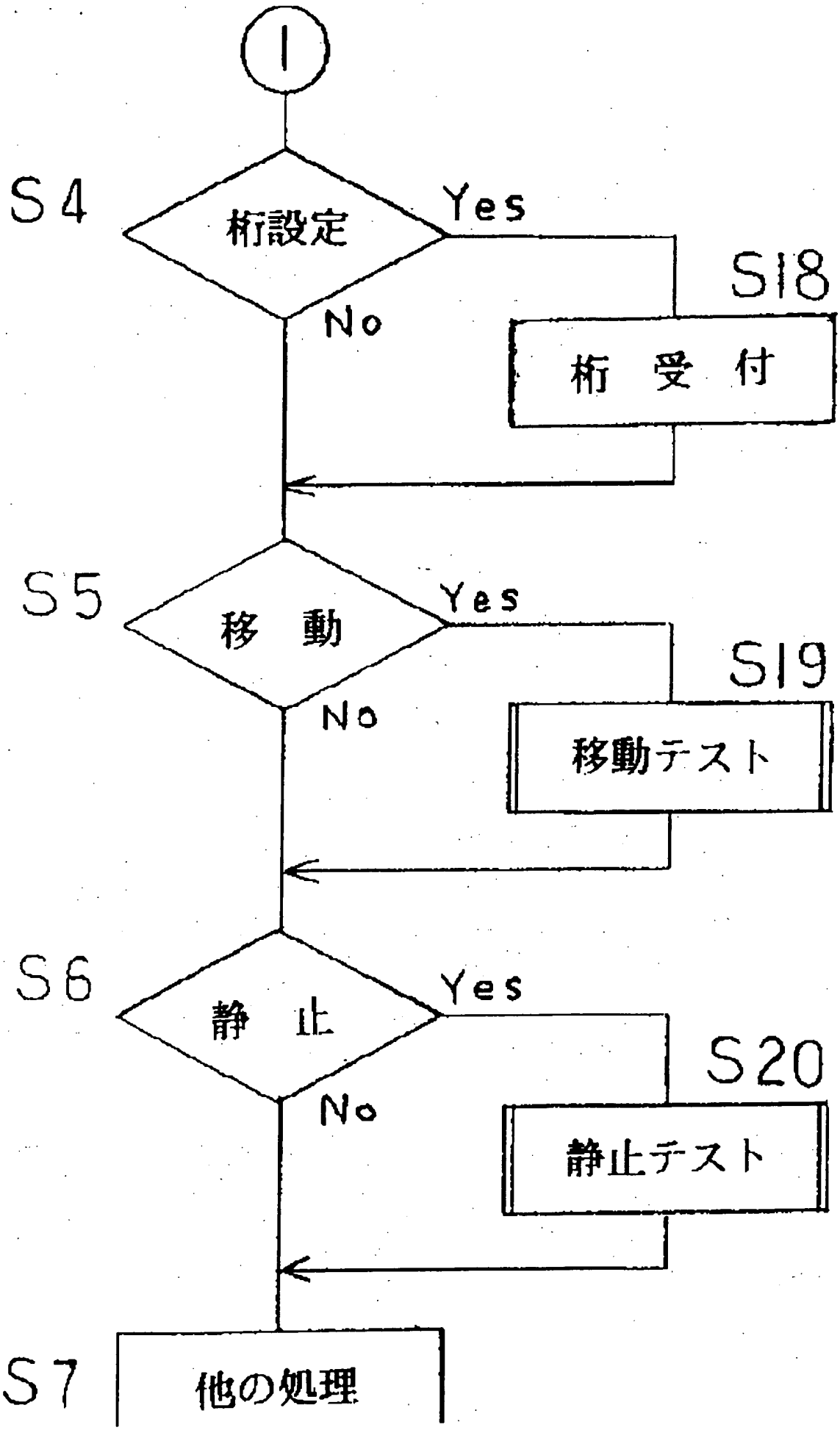
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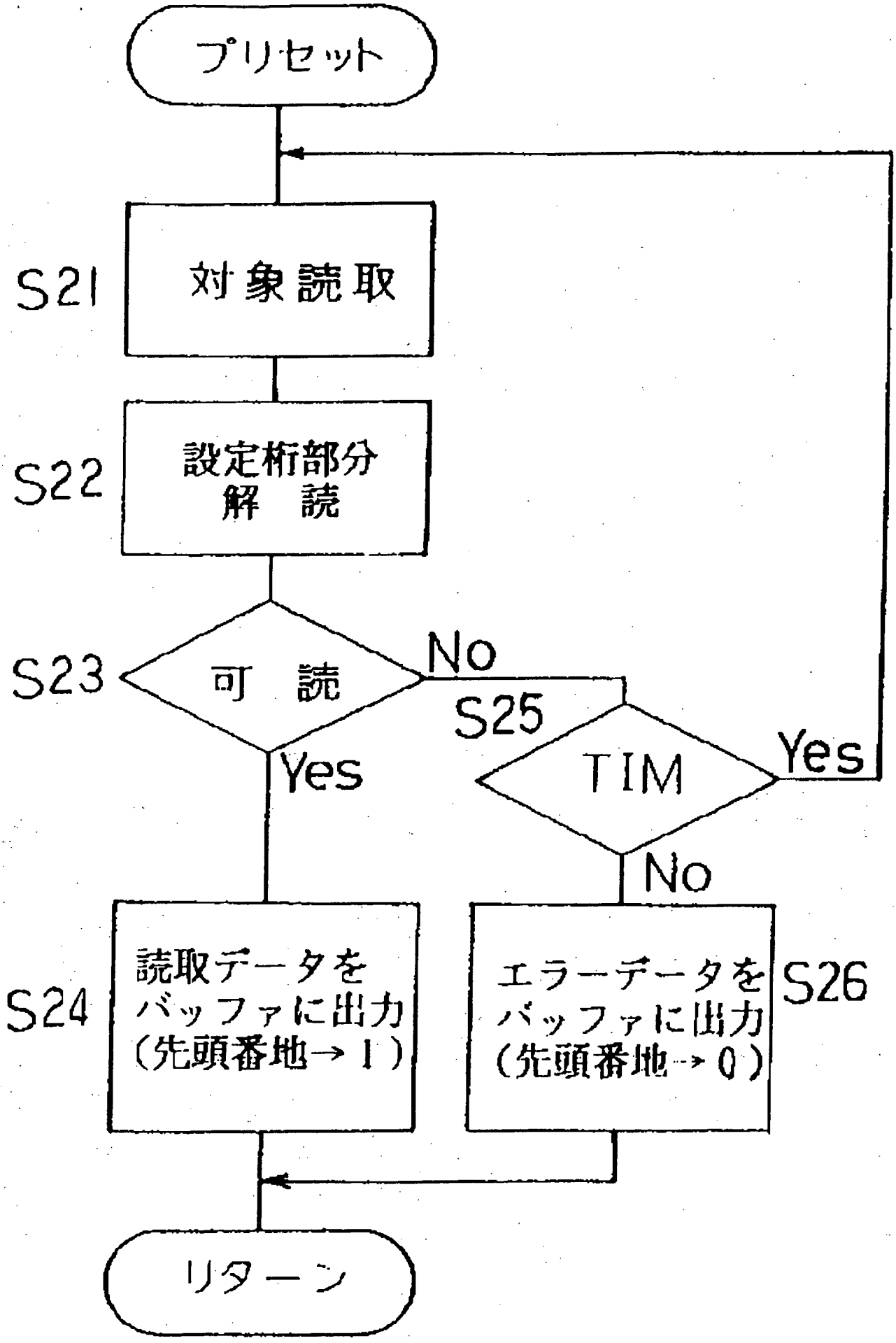
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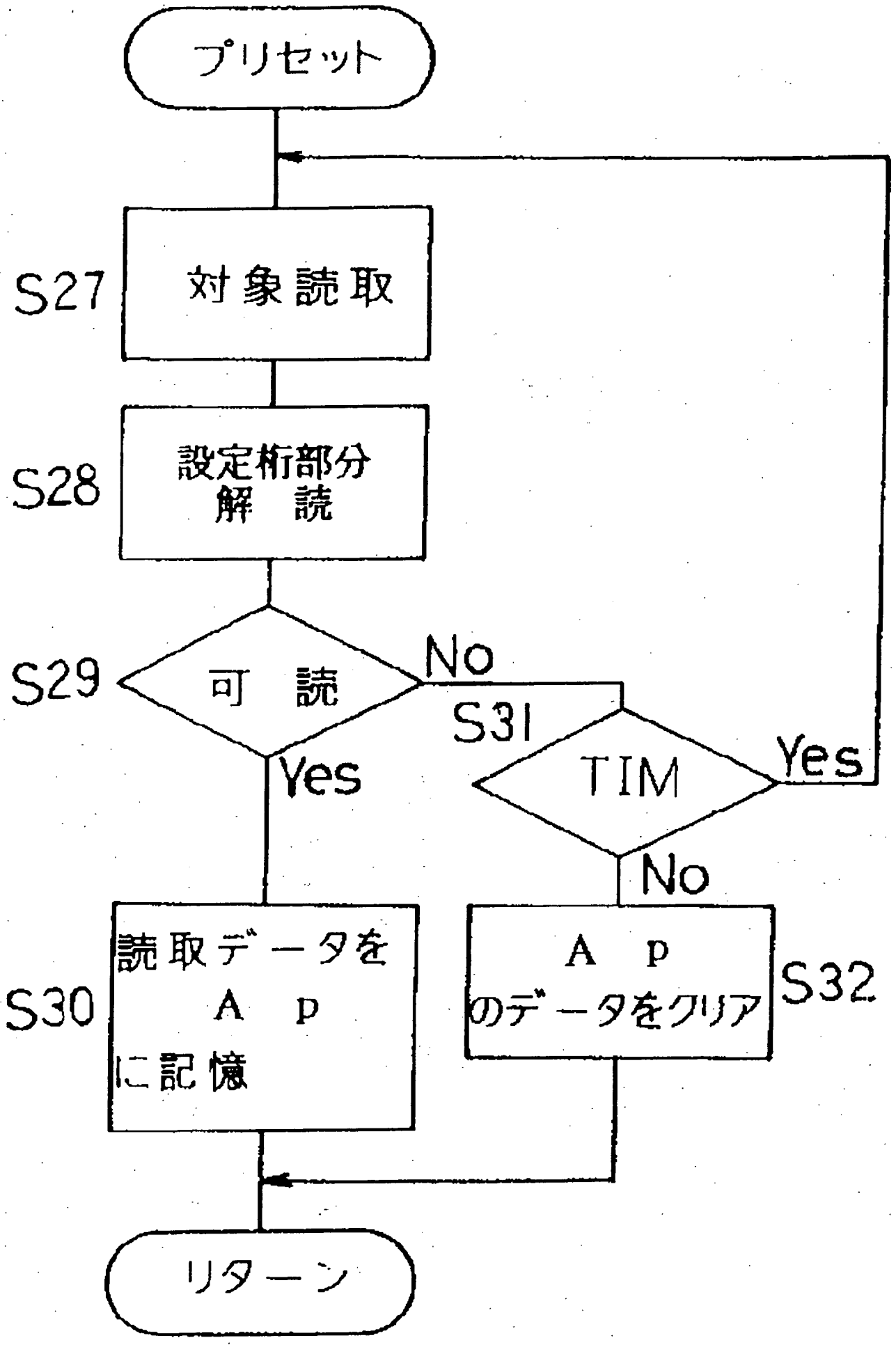
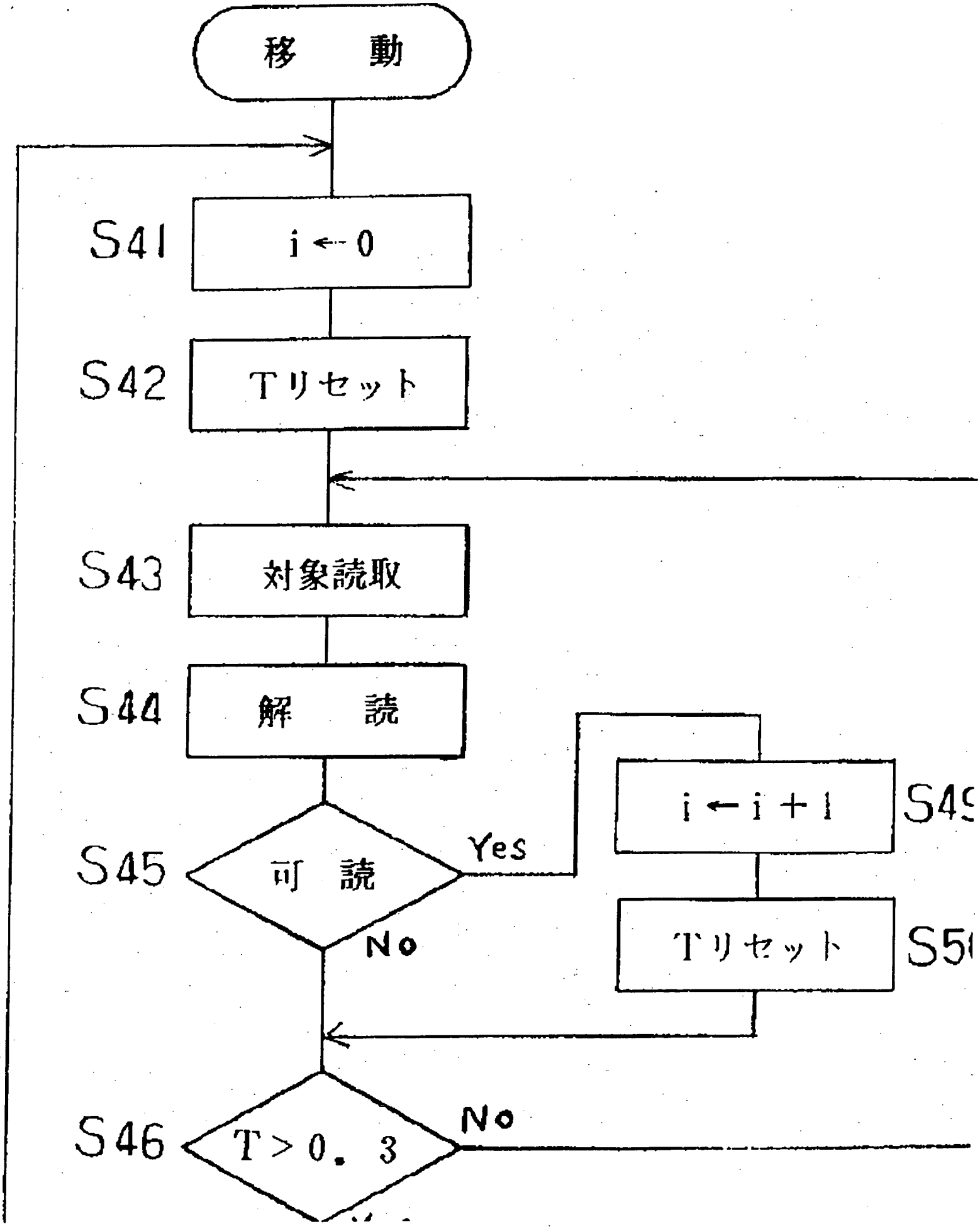
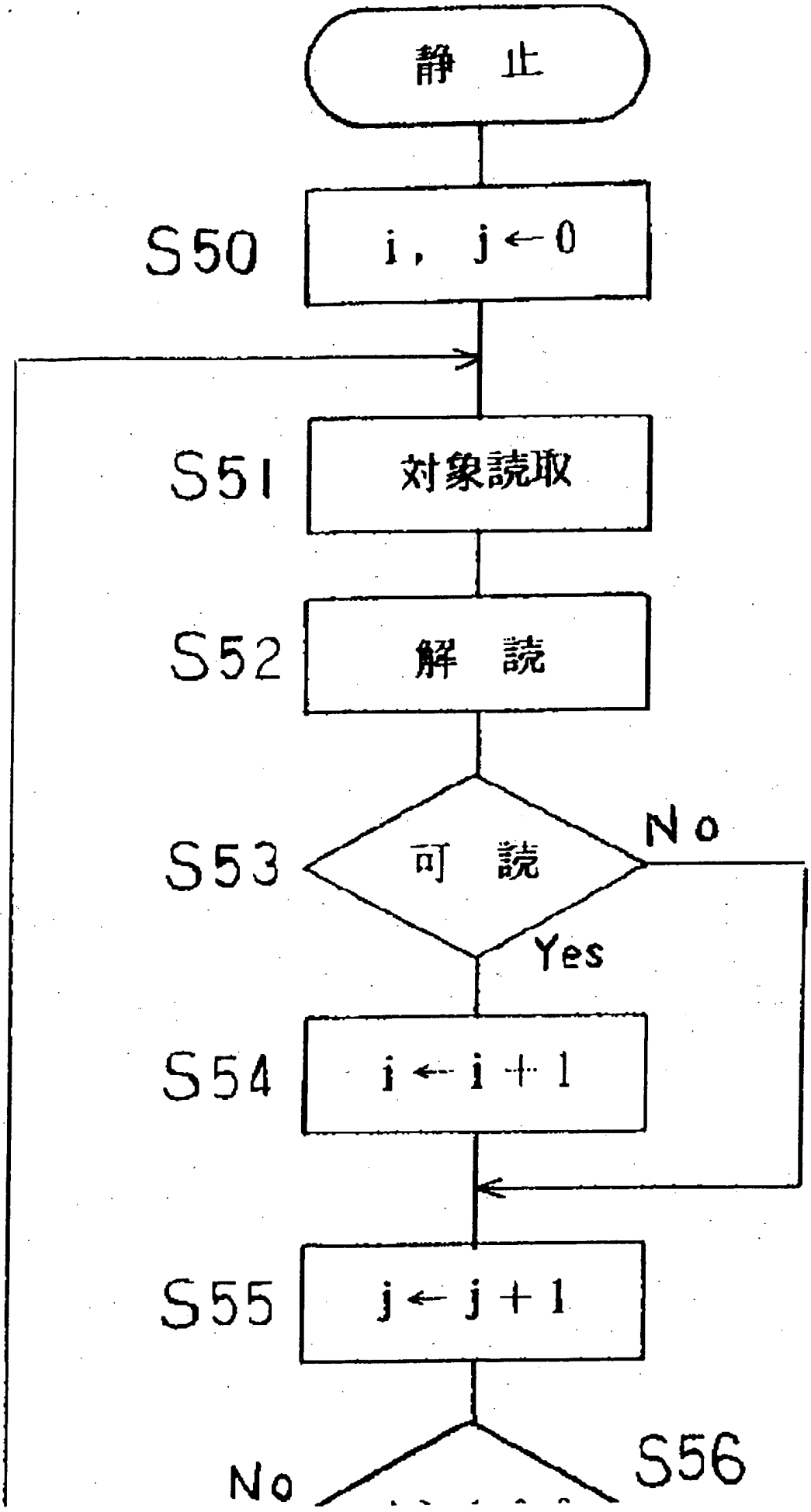
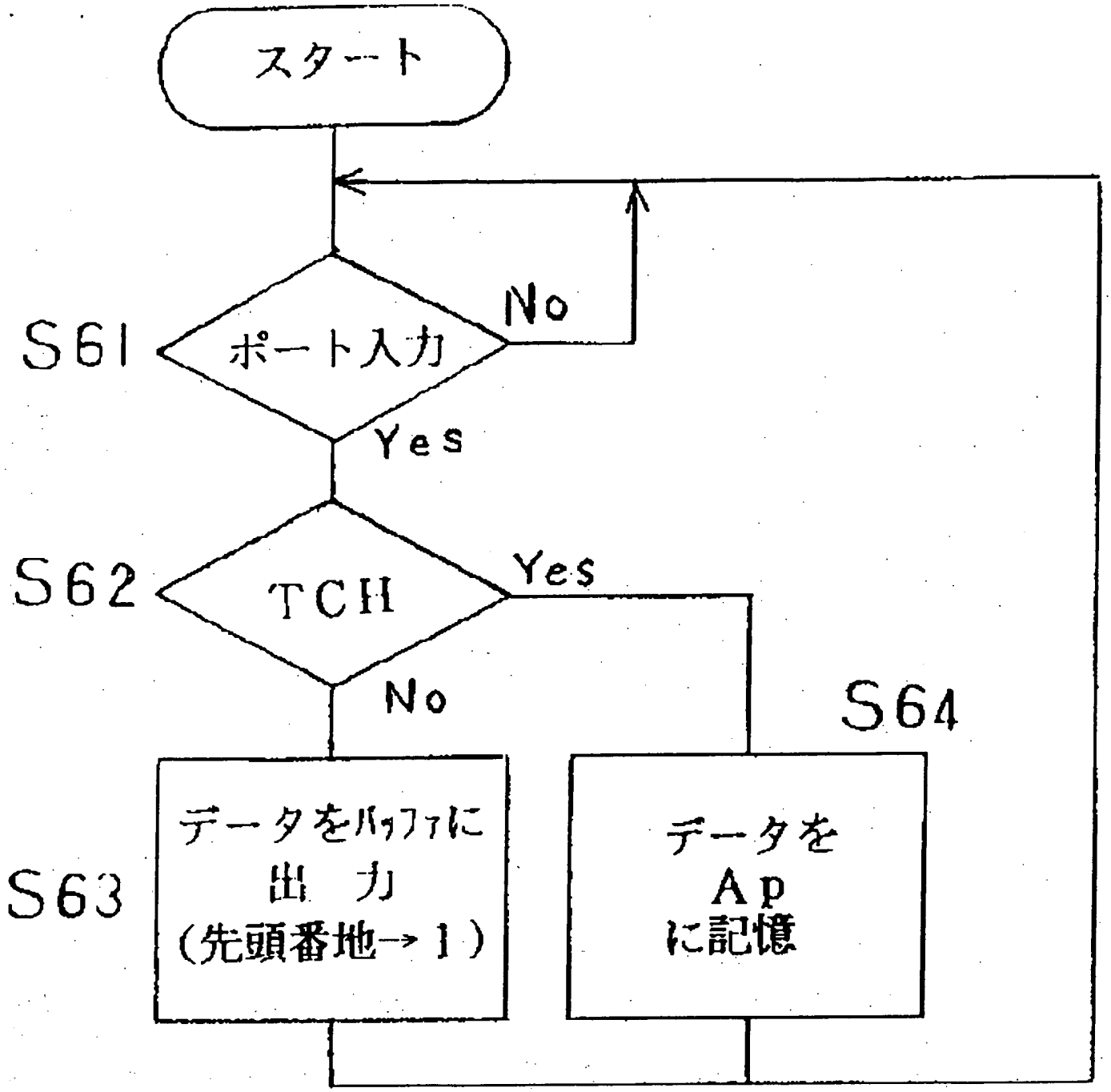
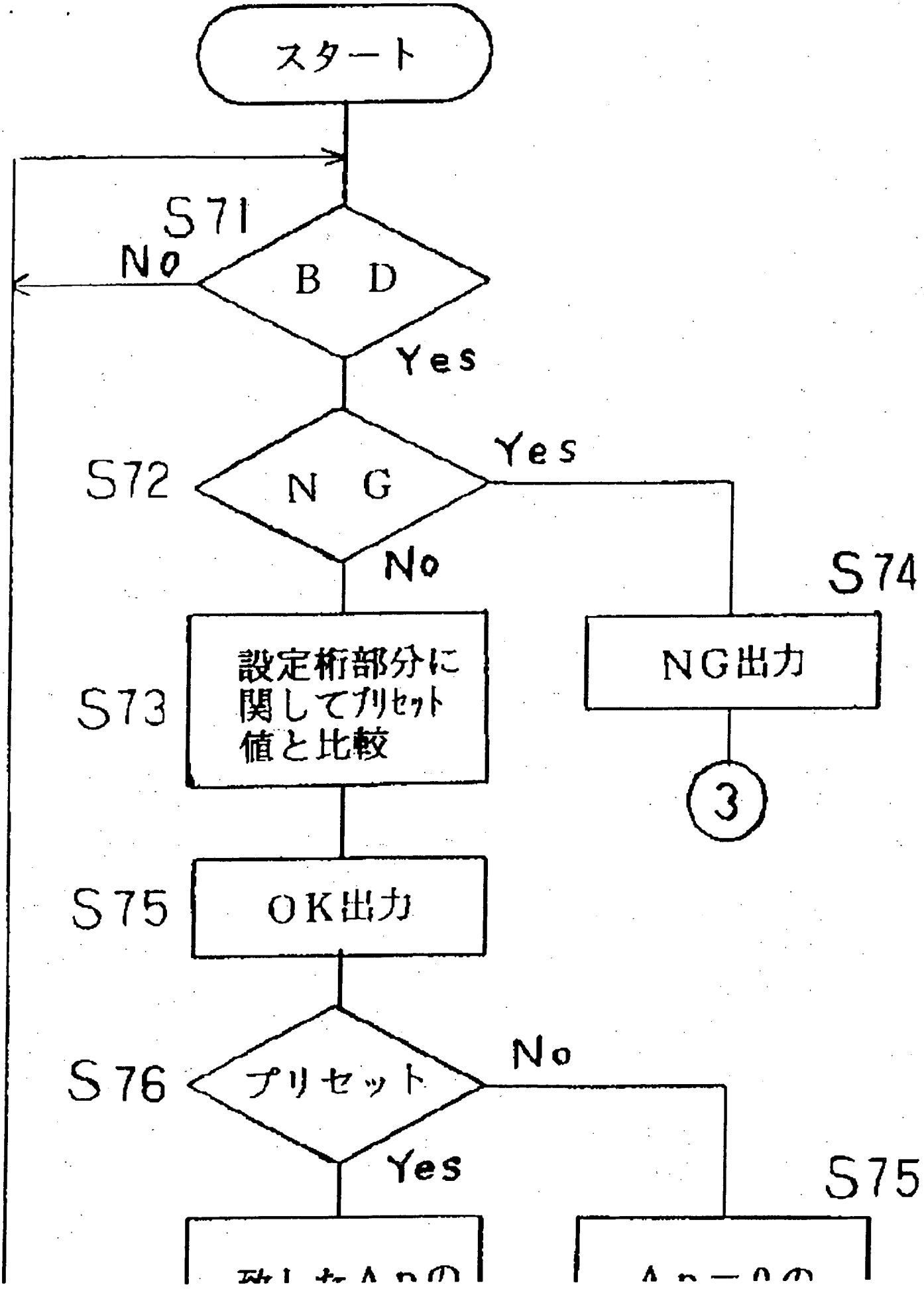
S26
リターン


プリセット
S27
対象読取
S28
設定桁部分
解　読
S29
可　読
No
S31
TIM
Yes
Yes
No
S30
読取データを
A　p
に記憶
A　p
のデータをクリア
S32
リターン


移　動
S41
i ← 0
S42
Tリセット
S43
対象読取
S44
解　読
S45
可　読
Yes
No
i ← i + 1
S49
Tリセット
S50
S46
T > 0．3
No


静　止
S50
i，j←0
S51
対象読取
S52
解　読
S53
可　読
No
Yes
S54
j←i＋1
S55
j←j＋1
No
S56


スタート
S61
ポート入力
No
Yes
S62
TCH
Yes
No
S64
S63
データをバッファに
出　力
(先頭番地→1)
データを
Ap
に記憶


スタート
S71
No
B D
Yes
S72
N G
Yes
No
S74
NG出力
S73
設定桁部分に関してプリセット値と比較
3
S75
OK出力
S76
プリセット
No
Yes
S75

| Ap | バーコード |
|---|---|
| 1 | 4 9 1 2 3 4 5 6 7 8 9 0 4 |
| 2 | 4 9 9 8 7 6 5 |
| 3 | 4 9 |
| . | . . . . |
| . | . . . . |
| . | . . . . |
| . | . . . . |
| . | . . . . |
| 31 | . . . . |

(A)

| Ap | Co |
|---|---|
| 0 | 0 |
| 1 | 1 |
| 2 | 1 |
| 3 | 1 |
| 4 | 2 |
| 5 | 2 |
| • | • |
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| • | • |
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| • | • |
| 31 | 5 |

(B)

| Ap | Co |
|---|---|
| 0 | 0 |
| 1 | 5 |
| 2 | 5 |
| 3 | 5 |
| 4 | 5 |
| 5 | 5 |
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| 31 | 5 |